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OBITUARY

P. ZEEMAN (1865-1943)

PIETER ZEEMAN, the famous Dutch Physicist, whose death has just been announced, was born at Zonnemain, Zeeland, in 1865. From 1885 to 1893 he studied at Leyden. In 1890 he became connected with the University as a privat-dozent and remained there until 1900 when he was appointed Professor at Amsterdam and later on Director of the Physical Institute. He made the great discovery known after him at the young age of 31, won the Nobel prize at the age of 37 and died at the age of 78. He was a member of many learned societies including the Royal Society and recipient of many degrees, medals, awards and numerous honours, and author of several papers and books.

Faraday had many years earlier, long searched for a relation between magnetism and light and had as early as 1862 placed a sodium flame in a magnetic field, observed the light in a spectroscope but found no effect. Faraday failed because his spectroscope did not possess the necessary resolving power and he did not use strong enough magnetic field. In 1896, Zeeman repeated Faraday's experiment with very strong magnetic fields and a powerful concave grating spectroscope and showed the splitting up of the spectral lines. The electron had just been discovered by J. J. Thomson and Lorentz on the basis of his theory of electrons supplied the explanation of Zeeman's great discovery. The normal triplets of Zn and Cd lines both with regards to their separation and polarisation were in complete accord with Lorentz's theory of electrons oscillating in atoms. The complex Zeeman effect of D lines and of green and blue lines of Zn and Cd which were soon after discovered by Zeeman and others were explained by Preston and Voigt and the discovery of the anomalous effect in the case of D lines by Paschen and Back in 1912 was further support and elucidation of the original theory. Bohr's theory of spectral lines was used by Debye and Sommerfeld in giving a newer explanation and opening up fresh fields of investigation.

Lande's prediction of a multiplicity of stationary states and the hypothesis of orientation applied to multiplets and later on the hypothesis of the spinning electron and the introduction of the splitting factor and the most important work on the hyperfine structure and investigation of Bismuth lines by Goudsmit and Back in weak and strong magnetic fields, furnished the complete explanation of the Zeeman effect. If Zeeman effect had not been discovered the nature of spectral series would have remained problematic.

It is a remarkable fact that though nearly half a century has elapsed since the discovery of the original effect, Zeeman's work has kept pace with the latest developments of atomic physics. Originally explained in an elegant manner on the classical theory, its full importance and explanation have been furnished by quantum theory and its effect on the nuclear physics has been of great value.

Zeeman's experimental genius has achieved valuable results in other fields too and his work on gravitation and mass and inertia has been of great importance, especially in the theory of Relativity.

He and his students have contributed a great deal to the investigation of hyperfine structure of spectrum lines and Zeeman effect on these. This has resulted in the development of apparatus of the highest resolving power and the use of the highest experimental skill. Zeeman's influence spread far beyond his country and valuable contributions have come from all over the world.

The world of science has lost a great genial personality whose epoch-making discovery has inspired research of the highest type in experimental and theoretical physics for nearly half a century and has yielded results of the greatest value in understanding the nature of the spectrum lines and the structure of matter.

Lucknow,
December 23, 1943.

WALI MOHAMMAD.